The POWeR of looking into the black box

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See Articles page 821

Translational studies using ecologically valid components are necessary to solve real-world problems such as obesity. In *The Lancet Diabetes & Endocrinology,* Paul Little and colleagues[1] offer an example of such research in their evaluation of the Positive Online Weight Management Plus (POWeR+) intervention—a web-based behavioural weight management program. The investigators assessed the efficacy of POWeR+ with either brief face-to-face nurse support (POWeR+F) or brief remote nurse support (POWeR+R) compared with an active control strategy (evidence-based dietary advice with two brief follow-up visits). The final intervention outcomes were modest, with patients in the POWeR+F group achieving an additional weight reduction of 1·5 kg (95% CI 0·6–2·4) over 12 months, and patients in the POWeR+R group achieving an additional 1·3 kg (0·34–2·2), compared with patients in the control group. However, when considered in combination with the incremental development of the initial POWeR program,[2,3] use of primary care facilities and behavioural theory to improve translation, and a promising economic evaluation, the intervention could prove beneficial for real-world weight management in the UK. Unfortunately, as the investigators acknowledge, the 12 month study duration does not allow for sufficient understanding of the long-term efficacy of the program. Indeed, there seemed to be early signs of weight regain based on the crude mean values presented (a 1 kg increase between months 6 and 12 in the POWeR+F group and a 1·5 kg increase in the POWeR+R group). A similar study[4] reported similar weight regains over a longer duration (24 months) and after higher initial losses, suggesting that there might be avenues to strengthen the POWeR+ intervention.

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As have many others in the eHealth field, Little and colleagues present what is now commonly referred to as a black box—an intervention with little knowledge of its internal workings. For example, to improve its longevity, the POWeR+ intervention targets psychological factors (eg, autonomous motivation), but no evaluation of changes in these constructs is presented. Furthermore, data for receipt of the intervention offer little insight into levels of user engagement and interaction with the website—a substantial component of the intervention. The average number of interactions reported represents more than half of the intended weekly logins, and some participants failed to access core components of the website. With no description of use over time, it is impossible to ascertain whether participants accessed the site ten times over a single week, rather than receiving the intended single weekly dose of, or exposure to, content. Little and colleagues' first prerogative was to evaluate weight loss, which is a crucial, objective outcome; however, successful receipt of the intervention should also be a crucial consideration of intervention efficacy. The data presented reinforce the possible importance of this consideration. The investigators report a 2–2·5 kg difference between patients who completed more than the core website components and those who did not—a value greater than the total intervention effects. This finding adds support to previous assertions about the importance of website engagement[5] and suggests the potential potency of website engagement for improving outcomes.

Admittedly, quantification of a person's receipt of intervention content might be difficult in real-world scenarios (eg, group education sessions). However, electronic tools and programs possess impressive ability to understand exposure, engagement, and retention, and, consequently, the intervention doses that participants receive—eg, what features were used (eg, webpages accessed), when, and for what duration? Presentation of eHealth interventions should aspire to the same rigorous standards as for other trials, and

guidelines have been developed to assist researchers working in this field.[6] Existing analysis of usage data has led to concepts such as non-use attrition[7] and intervention adherence[8] that have allowed much better understanding of intervention efficacy and avenues to improve potency of web-based interventions. For example, in a large web-based trial,[9] we witnessed weight loss results simultaneously with poor initial retention and poor uptake of specific website features. With analysis of intervention data, we were able to understand key website features that predict weight loss in order to improve future interventions. During piloting of the initial POWeR intervention, usage metrics were also analysed in great depth,[10] yet no such data are reported in the present study. Not all usage data need to be explored this deeply, and simple data can still offer insight into intervention adherence, uptake, and exposure without diluting evaluation of primary outcomes or alienating specific readerships, when reported appropriately.[4]

Future studies should aspire to incorporate excellent translational strategies and rigorous research methods such as those used by Little and colleagues, but they also need to unlock the black box so interventions can rise to the challenge of long-term weight maintenance.[11] Some findings have suggested that technology can provide only a transient effect[12] and that face-to-face contact might be the answer to longer term maintenance of weight loss.[13] Carefully developed, integrated interventions such as POWeR+ might be able to overcome these limitations. However, an intervention's true efficacy will only be fully understood when we can ensure that participants are receiving the intended intervention dose. This is particularly the case when eHealth components are integral to an intervention because user engagement could be a crucial moderator of success.

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I declare no competing interests

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Knowing what we do not know: statin therapy in advanced chronic kidney disease

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See Articles page 829

Lowering LDL cholesterol with statins clearly reduces the risk of cardiovascular events among individuals at increased cardiovascular risk, and is a mainstay of contemporary approaches to cardiovascular disease prevention. Chronic kidney disease is a well established independent risk factor for cardiovascular events, but guidelines vary in their approach to lipid-lowering in this population. The European Society of Cardiology/European Atherosclerosis Society (ESC/EAS) guidelines suggest that chronic kidney disease is an indication for statin therapy, whereas the American College of Cardiology (ACC)/American Heart Association (AHA) guidelines do not.[1] The KDIGO (Kidney Disease: Improving Global Outcomes) guidelines recommend